Journal of Mantik, 5 (3) (2021) 2013-2019

Published by:Institute of Computer Science (IOCS)

Mantik Journal

Journal homepage: www.iocscience.org/ejournal/index.php/mantik/index

Online Exam Application Study Using the Pieces Framework Method

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ARTICLEINFO

Article history:

Received: September 18, 2021
Revised: October 11, 2021
Accepted: November 28, 2021

Keywords:

Evaluation,
Pieces Framework,
Information Systems,
web,
Exam.

ABSTRACT

To find out the level of success in web-based or online implementation and have to do an evaluation. Evaluation is in the form of a reference or benchmark used in relation to the audit of the information system analysis method itself, by looking at the performance of a system quantitatively and qualitatively. The purpose of this study was to evaluate the level of success, efficiency, effectiveness, and company profits in implementing an online-based exam system conducted at the AMIK Tunas Bangsa Pematangsiantar campus. In providing analysis or evaluation of a system, it can be done with several analytical models. In this study, a model analysis framework will be used, namely by using the Pieces Framework method.

1. Introduction

Ability or success during the educational process, for higher education levels, the process of evaluating learning outcomes is carried out through direct observation by several lecturers who take care of a subject that is seen in the educational process of students and is assessed through a test or also called an exam. This exam or test is carried out periodically or a certain time span during the education period. At educational institutions, examination activities are carried out in two ways, both in writing and in practice, including at the Tunas Bangsa Academy of Information and Computer Management (AMIK Tunas Bangsa). (USA).

Currently, the implementation of both UTS and UAS exams on campus is carried out online using a local network. This online exam system is carried out by means of students being required to fill in answers according to the questions displayed using a laptop, the exam schedule is carried out according to the lecture schedule for each course. Students will receive proof of examination marks as proof that the student has taken the exam. To find out the level of success in implementing the online exam system, an evaluation must be carried out. Evaluation is a reference or benchmark used related to the methods of auditing the information system audit itself, by looking at the results of the performance of a system both quantitatively and qualitatively (Mahmudi, 2011). Evaluation of an existing system, It is hoped that the company being evaluated will better understand and understand the obstacles and benefits of using the system that has been running so far. So that the costs incurred by the company to computerize its operational and managerial flows are more effective and efficient, it is not useless if the results achieved are in accordance with or close to the targets or targets that have been determined in the initial planning.

In providing an evaluation of a system, it can be done with several analytical models. In this study, the PIECES Framework analysis model was used. The PIECES Framework itself is a tool in analyzing computer-based information systems, which consists of important points that are useful as guidelines or references in analyzing the system. In short, the PIECES Framework contains important things in system evaluation, such as: Performance, Information and data, Economics, Control and security, Efficiency, and lastly Service. PIECES as a system analysis tool, a detailed and comprehensive system will receive special attention, so that the strengths and weaknesses of the system can be known to later be used as a reference for the company's further progress.

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2. Methods

The research method or type of research used in this study uses descriptive quantitative research which aims to describe, summarize, share conditions, various situations or various variables that arise in the community that is the object of research, in this case the object of research taken is an online exam system. [1].

2.1 Sample Selection

a Population

Population is a generalization area consisting of objects or subjects that have certain qualities and characteristics determined by the researcher to be studied and then draw conclusions. The population used is students in the AMIK Tunas Bangsa campus from 5 (five) different classes where the total number of students is 126 people.

b Research Respondents

The sampling technique used is random sampling, where respondents are taken randomly from each class. In this study, each class was taken by 5 people as a sample of respondents so that the total was 25 respondents.

2.2 Method of collecting data

a Observation

Observation is used to verify information gathered using other approaches and to determine how a system actually works, not to know how it should work.

b Interview

The interview method was carried out to explore information and information as well as the efforts and obstacles experienced by the library related to the existing system.

c Questionnaire/Questionnaire

The questionnaire method is used to obtain information from users about the services and systems that are running, this will add to the existing problems from the point of view of the user as a system user.

2.3 Measurement Method

To get the results of the evaluation of the online exam information system, a measurement method is needed [2]. The scale used in the questionnaire to provide a number of questions and statements to respondents using the linkert scale. The linkert scale is used to measure attitudes, opinions and perceptions of a person or group of people about social phenomena. The choice of each answer for respondents' responses to the quality dimension of satisfaction was scored as follows:

TABLE 1.
Linkert Scale

Answer	*Acronym*	*Score*
Strongly agree	SS	5
Agree	S	4
Doubtful	RG	3
Do not agree	TS	2
Strongly disagree	STS	1

2.4 Data analysis method

To perform data analysis, the method used is to determine the average value of each statement contained in the questionnaire, but before determining the average value, the value of the class interval must first be known to determine the characteristics of the assessment of the online exam information system. Below is a formula for determining class intervals and average grades.

Class Interval Formula:

$$i = \frac{r}{k} (1)$$

Formula for Determining the Average Value:

$$r = \frac{f}{n} (2)$$

Rating Characteristics:

$$i = \frac{r}{k} = \frac{5-1}{5} = \frac{4}{5} = 0.8$$

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The class interval value obtained is 0.8 so that based on the combination of the Linkert scale and class interval, it will produce the following table:

TABLE 2.
Rating Characteristics

Scale	Rating Category
1.00 - 1.80	Very good
1.81 - 2.61	Bad
2.62 - 3.42	Bad enough
3.43 - 4.23	Well
4.24 - 5.04	Very bad

3. Results and Analysis

Based on the results of distributing questionnairesor a questionnaire to 25 students from four different classes as users of the online exam information system to get the results of the evaluation of the application of the online exam information system, then the results of the questionnaire are recapitulated and calculated using the class interval formula and the average score, then measured based on the characteristics of the assessment on each variable from the PIECES Framework. The following is the result of the calculation of the questionnaire related to the evaluation of the application of the online exam information system

Based on the results of distributing questionnaires or questionnaires to 25 students from four different classes as users of the online exam information system to get results from the evaluation of the application of the online exam information system, the results of the questionnaire are recapitulated and calculated using the class interval formula and the average value, then measured based on the characteristics of the assessment of each variable from the PIECES Framework. The following are the results of the calculation of the questionnaire related to the evaluation of the application of the online exam information system:

3.1 Results of Calculation and Data Analysis on Domain Performance.

In the domain of system performance there are four statement points related to the performance of the online exam system, the results of the calculations for each statement can be seen in table 3 below.

TABLE 3.
Domain Performance Calculation Results Statement 1

Answer Options	F	Total Score
Strongly Disagree	0	0
Do not agree	0	0
Doubtful	2	6
Agree	5	20
Strongly agree	18	90
TOTAL	25	116

TABLE 4.
Domain Performance Calculation Results Statement 2

Answer Options	F	Total Score
Strongly Disagree	0	0
Do not agree	1	2
Doubtful	5	15
Agree	10	40
Strongly agree	9	45
TOTAL	25	102

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TABLE 5.
Domain Performance Calculation Results Statement 3

Answer Options	F	Total Score
Strongly Disagree	2	2
Do not agree	9	18
Doubtful	10	30
Agree	4	16
Strongly agree	0	0
TOTAL	25	66

TABLE 6.
Domain Performance Calculation Results Statement 4

Answer Options	F	Total Score
Strongly Disagree	0	0
Do not agree	0	0
Doubtful	6	18
Agree	9	36
Strongly agree	10	50
TOTAL	25	104

TABLE 7.
Resume Values Total Score Questionnaire Domain Performance

Indicator	Respon se	mean	Category
PER 1	25	4.64	Very good
PER 2	26	4.08	Well
PER 3	27	2.64	Pretty good
PER 4	28	4.16	Well
TOTAL		3.88	Well

Based on the results of the calculation of the average value in the performance domain, it was obtained a value of 3.88 and based on the characteristics table the assessment was in the good category. So this shows a positive indication that the performance of the online exam information system is acceptable and running well.

3.2 Results of Calculation and Data Analysis of Domain Information and Data.

In the Information and Data domain, there are nine statement points related to data and information from the online exam system, the results of the calculations for each statement can be seen in the table below.

TABLE 8.
Calculation Results of Domain Information And Data Statement 1

Answer Options	F	Total Score
Strongly Disagree	0	0
Do not agree	6	12
Doubtful	6	18
Agree	8	32
Strongly agree	5	25
TOTAL	25	87

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TABLE 9.
CALCULATION RESULTS OF DOMAIN INFORMATION AND DATA STATEMENT 2

Answer Options	F	Total Score
Strongly Disagree	0	0
Do not agree	0	0
Doubtful	0	0
Agree	10	40
Strongly agree	15	75
TOTAL	25	115

TABLE 10.
Calculation Results of Domain Information And Data Statement 3

Answer Options	F	Total Score
Strongly Disagree	3	3
Do not agree	5	10
Doubtful	2	6
Agree	10	40
Strongly agree	5	25
TOTAL	25	84

TABLE 11.
Result of Calculation of Domain Information and Data Statement 4

Answer Options	*F*	*Total Score*
Strongly Disagree	2	2
Do not agree	5	10
Doubtful	7	21
Agree	11	44
Strongly agree	0	0
TOTAL	25	77

TABLE 12.
Calculation Results of Domain Information And Data Statement 5

Answer Options	*F*	*Total Score*
Strongly Disagree	0	0
Do not agree	6	12
Doubtful	6	18
Agree	8	32
Strongly agree	5	25
TOTAL	25	87

TABLE 13.
Calculation Results of Domain Information And Data Statement 6

Answer Options	*F*	*Total Score*
Strongly Disagree	0	0
Do not agree	0	0
Doubtful	0	0
Agree	15	60
Strongly agree	10	50
TOTAL	25	110

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TABLE 14.
Calculation Results of Domain Information And Data Statement 7

Answer Options	F	Total Score
Strongly Disagree	2	2
Do not agree	6	12
Doubtful	6	18
Agree	5	20
Strongly agree	6	30
TOTAL	25	82

TABLE 15.
Calculation Results of Domain Information And Data Statement 8

Answer Options	F	Total Score
Strongly Disagree	0	0
Do not agree	0	0
Doubtful	5	15
Agree	10	40
Strongly agree	10	50
TOTAL	25	105

TABLE 16.
Result of Calculation of Domain Information and Data Statement 9

Answer Options	F	Total Score
Strongly Disagree	0	0
Do not agree	0	0
Doubtful	7	21
Agree	8	32
Strongly agree	10	50
TOTAL	25	103

TABLE 17.
Resume Values Total Score Questionnaire Domain Information And Data

Indicator	*Response*	*mean*	*Category*
PER 1	25	4.32	Very good
PER 2	25	4.6	Very good
PER 3	25	3.36	Pretty good
PER 4	25	3.08	Pretty good
PER 5	25	3.48	Well
PER 6	25	4.4	Very good
PER 7	25	3.28	Pretty good
PER 8	25	4.2	Well
PER 9	25	4.12	Well
TOTAL		3.87	Well

4. Conclusion

By using the PIECES framework in evaluating the online exam information system, the average score for each domain is obtained, namely the Performance domain with a score of 3.88 in the Good category, Information & Data with a score of 3.87 in the Good category, Economics with a score of 3.85 with Good category, Control & Security scored 3.99 in the Good category, Efficiency scored 4.09 in the Good category and Service received a score of 4.02 in the Good category. The online exam information system must continue to be developed in order to improve the competence of higher education institutions.

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